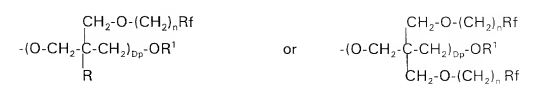
WHAT IS CLAIMED IS:

1. A monohydric polyfluorooxetane oligomer composition, comprising:

a unit of the formula



or combinations thereof, where OR^1 is derived from a monoalcohol, where Dp is from about 2 to about 20, where each n is the same or different and independent is an integer from 1 to about 6, R is hydrogen or an alkyl of 1 to 6 carbon atoms, and each Rf is the same or different and independently on each repeat unit is a linear or branched fluorinated alkyl of 1 to 20 carbon atoms, a minimum of 75 percent of the non-carbon atoms of the alkyl being fluorine atoms and optionally the remaining non-carbon atoms being H, I, Cl, or Br; or each Rf is the same or different and independently is a perfluorinated polyether having from 4 to 60 carbon atoms,

said composition having less than about 10% by weight of cyclic oligomer therein based upon the total weight of said oligomer, and any polymer, or copolymer produced.

2. A monohydric polyfluorooxetane oligomer composition according to claim 1, wherein R^1 is derived from a monoalcohol comprising an organic alcohol, a polymeric alcohol, a tetrafluoroethylene based telomer fluoroalcohol, or combinations thereof, wherein said monoalcohol is a co-initiator solvent, and wherein the amount of any cyclic oligomer is less than about 8% by weight.

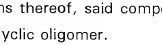
3. A monohydric polyfluorooxetane oligomer composition according to claim 2, wherein said organic alcohol has from 1 to 40 carbon atoms, wherein said polymeric alcohol contains repeat units derived from an alkylene oxide having from 2 to 6 carbon atoms and the number of repeat groups is from about 3 to about 30, and wherein said tetrafluoroethylene based telomer is $CF_3CF_2(CF_2CF_2)_x\ CH_2CH_2OH$ where x is from 1 to about 19,

wherein said Dp is from about 2 to about 10, and

wherein each Rf is the same or different and independently is a linear or branched fluorinated alkyl having from 1 to about 15 carbon atoms, said composition having less than about 5% by weight of cyclic oligomer.

4. A monohydric polyfluorooxetane oligomer composition according to claim 3, wherein OR^1 is derived from benzyl alcohol, trifluoroethanol, ally alcohol, heptafluorobutanol, pentafluoropropanol, pentafluorobutanol, nonafluorohexanol, various perfluoroalkylethanols, or combinations thereof, said composition having less than about 3% by weight of cyclic oligomer.

5. A monohydric polyfluorooxetane oligomer composition according to claim 4, wherein said oligomer or polymer is said



wherein n is 1 to about 3, wherein R is methyl or ethyl, and wherein Rf contains from 1 to about 8 carbon atoms, wherein Rf contains a minimum of 85% of the non-carbon atoms of the alkyl being fluorine atoms, wherein said Dp is from about 2 to about 4, said composition having less than about 1% by weight of cyclic oligomer.

6. A monohydric polyfluorooxetane copolymer composition according to claim 1, including at least a unit derived from a monomer containing at least an epoxy (oxirane) functionality, a monomer having a 4-membered cyclic ether group (oxetane); a monomer having a 5-membered cyclic ether group, 1,4-dioxane, 1,3-dioxane, 1,3-dioxalane, trioxane, or caprolactone; or combinations thereof.

7. A monohydric polyfluorooxetane copolymer composition according to claim 3, including at least a unit derived from a monomer containing an epoxy (oxirane) functionality, a monomer having a 4-membered cyclic ether group (oxetane); a monomer having a 5-membered cyclic ether group, 1,4-dioxane, 1,3-dioxane, 1,3-dioxalane, trioxane, or caprolactone; or combinations thereof.

8. A monohydric polyfluorooxetane copolymer composition according to claim 5, including at least a unit derived from a monomer containing an epoxy (oxirane) functionality, a monomer having a 4-membered cyclic ether group (oxetane); a monomer having a 5-membered cyclic ether group, 1,4-dioxane, 1,3-dioxane, 1,3-dioxalane, trioxane, or caprolactone; or combinations thereof.

9. A composition according to claim 1, wherein said composition is derived from a solution substantially free of a non-initiator solvent.

10. A composition according to claim 3, wherein said composition is derived from a solution having less than about 10% by weight of a non-initiator solvent based upon the total weight of said non-initiator solvent and said monoalcohol.

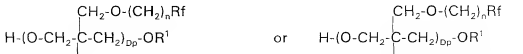
11. A composition according to claim 5, wherein said composition is derived from a solution having less than about 3% by weight of a non-initiator solvent based upon the total weight of said non-initiator solvent and said monoalcohol.

12. A composition according to claim 6, wherein said composition is derived from a solution having less than about 10% by weight of a non-initiator solvent based upon the total weight of said non-initiator solvent and said monoalcohol.

13. A composition according to claim 7, wherein said composition is derived from a solution having less than about 5% by weight of a non-initiator solvent based upon a total weight of said non-initiator solvent and said monoalcohol.

14. A composition according to claim 8, wherein said composition is derived from a solution having less than about 3% by weight of a non-initiator solvent based upon a total weight of said non-initiator solvent and said monoalcohol.

15. A monohydric polyfluorooxetane composition, comprising: an oligomer or polymer of the formula



or combinations thereof, where OR^1 is derived from a monoalcohol, where Dp is from 2 to about 150, where each n is the same or different and independent is an integer from 1 to about 6, R is hydrogen or an alkyl of 1 to 6 carbon atoms, and each Rf is the same or different

and independently on each repeat unit is a linear or branched fluorinated alkyl of 1 to 20 carbon atoms, a minimum of 75 percent of the non-carbon atoms of the alkyl being fluorine atoms and optionally the remaining non-carbon atoms being H, I, Cl, or Br; or each Rf is the same or different and independently is a perfluorinated polyether having from 4 to 60 carbon atoms.

16. A monohydric polyfluorooxetane composition according to claim 15, wherein R^1 is derived from a monoalcohol comprising an organic alcohol, a polymeric alcohol, a tetrafluoroethylene based telomer fluoroalcohol, or combinations thereof, and wherein said Dp is from 2 to about 50.

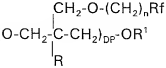
17. A monohydric polyfluorooxetane composition according to claim 16, wherein said organic alcohol has from 1 to 40 carbon atoms, wherein said polymeric alcohol contains repeat units derived from an alkylene oxide having from 2 to 6 carbon atoms wherein the number of said repeat groups is from about 3 to about 30, and wherein said tetrafluoroethylene based telomer is $CF_3CF_2(CF_2CF_2)_x$ CH_2CH_2OH where x is from 1 to about 19,

wherein said Dp is from about 2 to about 20, and

wherein each Rf is the same or different and independently is a linear or branched fluoronated alkyl having from 1 to about 15 carbon atoms.

18 A monohydric polyfluorooxetane composition according to claim 17, wherein OR^1 is derived from benzyl alcohol, trifluoroethanol, ally alcohol, heptafluorobutanol, pentafluoropropanol, pentafluorobutanol, nonafluorohexanol, various perfluoroalkylethanols, or combinations thereof.

19. A monohydric polyfluorooxetane composition according to claim 18, wherein said oligomer or polymer is said



wherein n is 1 to about 3, wherein R is methyl or ethyl, and wherein Rf contains from 1 to about 8 carbon atoms and has at least 85% of the non-carbon atoms being fluorine atoms.

20. A monohydric polyfluorooxetane oligomer or polymer composition according to claim 15, wherein said composition contains an amount of cyclic oligomer which is less than about 10% by weight based upon the total weight of said polyfluorooxetane oligomer, polymer, or any copolymer produced.

21. A monohydric polyfluorooxetane oligomer or polymer composition according to claim 17, wherein said composition contains an amount of cyclic oligomer which is less than about 5% by weight based upon the total weight of said polyfluorooxetane oligomer, polymer, or any copolymer produced.

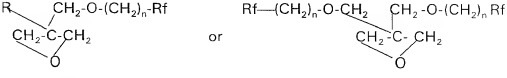
22 A monohydric polyfluorooxetane oligomer or polymer composition according to claim 19, wherein said composition contains an amount of cyclic oligomer which is less than about 3% or less by weight based upon the total weight of said polyfluorooxetane oligomer, polymer, or any copolymer produced.

23. A process for forming a monohydric polyfluorooxetane composition, comprising the steps of:

reacting a monoalcohol with a fluorooxetane monomer in the presence of a Lewis acid catalyst, and forming an oligomer, polymer, or copolymer.

24. A process according to claim 10, wherein said monoalcohol comprises an organic alcohol, a polymeric alcohol, a tetrafluoroethylene based telomer fluoroalcohol, or combinations thereof,

wherein said fluorooxetane monomer has the formula

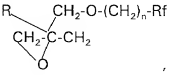


or combinations thereof, where each n is the same or different and independently is an integer from 1 to about 6, R is hydrogen or an alkyl of 1 to 6 carbon atoms, and each Rf is the same or different and independently on each repeat unit is a linear or branched fluoronated alkyl of 1 to 20 carbon atoms, a minimum of 75 percent of the non-carbon atoms of the alkyl being fluorine atoms and optionally the remaining non-carbon atoms being H, I, Cl, or Br; or each Rf is the same or different and independently is a perfluorinated polyether having from 4 to 60 carbon atoms.

25. A process according to claim 24, wherein said organic alcohol has from 1 to 40 carbon atoms, wherein said polymeric alcohol contains repeat units derived from an alkylene oxide having from 2 to 6 carbon atoms wherein the number of repeat groups is from about 3 to about 30, and wherein said tetrafluoroethylene based telomer is $CF_3CF_2(CF_2CF_2)_x$ CH_2CH_2OH where x is from 1 to about 19, and wherein the number of repeat units in said oligomer, polymer, or copolymer is from 2 to about 150.

26. A process according to claim 25, including conducting said reaction in a solution substantially free of a non-initiator solvent, wherein the number of repeat units in said oligomer or polymer is from about 2 to about 50, wherein each Rf is the same or different and independently is a linear or branch fluoronated alkyl having from 1 to about 15 carbon atoms, wherein said fluorooxetane monomers are polymerized at a temperature of from about 0°C to about 100°C, wherein in said cationic catalyst is a complex of boron trifluoride-tetrahydrofuran, and wherein said monoalcohol is benzyl alcohol, trifluoroethanol, allylic alcohol, heptafluorobutanol, pentafluoropropanol, pentafluorobutanol, non fluorohexanol, various perfluoroalkylethanols, or combinations thereof, and wherein the amount of any non-initiator solvent is about 5% by weight or less based upon the total weight of said non-initiator solvent and said monoalcohol.

27. A process according to claim 26, wherein said fluorooxetane monomer is said



where R is methyl or ethyl, wherein n is 1 to about 3, and wherein Rf contains from 1 to 8 carbon atoms and has at least 85% of the non-carbon atoms being fluorine atoms, and wherein the number of repeat groups of said oligomer, polymer, or copolymer is from about 2 to about 20.

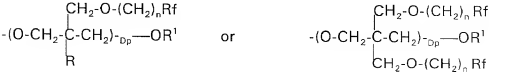
28. A process according to claim 23, wherein said composition contains an amount of cyclic oligomer which is less than about 10% by weight based upon the total weight of said polyfluorooxetane oligomer, polymer, or copolymer.

29. A process according to claim 25, wherein said composition contains an amount of cyclic oligomer which is less than about 5% by weight based upon the total weight of said polyfluorooxetane oligomer, polymer, or copolymer.

30. A process according to claim 27, wherein said composition contains an amount of cyclic oligomer which is less than about 2% or less by weight based upon the total weight of said polyfluorooxetane oligomer, polymer, or copolymer.

31. A monohydric polyfluorooxetane copolymer composition, comprising:

at least one unit having the formula



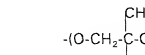
or combinations thereof, where OR^1 is derived from a monoalcohol, where Dp is from 2 to about 150, where n is the same or different and independently is an integer from 1 to about 6, R is hydrogen or an alkyl of 1 to 6 carbon atoms, and each Rf is the same or different and independently on each repeat unit is a linear or branched fluorinated alkyl of 1 to 20 carbon atoms, a minimum of 75 percent of the non-carbon atoms of the alkyl being fluorine atoms and optionally the remaining non-carbon atoms being H, I, Cl, or Br; or each Rf is the same or different and independently is a perfluorinated polyether having from 4 to 60 carbon atoms, and

at least one different co-unit.

32. A monohydric polyfluorooxetane copolymer composition, according to claim 31, wherein R^1 is derived from a monoalcohol comprising an organic alcohol, a polymeric alcohol, a tetrafluoroethylene based telomer fluoroalcohol, or combinations thereof, and wherein said Dp is from 2 to about 50.

33. A monohydric polyfluorooxetane copolymer composition according to claim 32, wherein Rf is a perfluoronated alkyl group have from 1 to 15 carbon atoms, wherein said organic alcohol has from 1 to 40 carbon atoms, wherein said polymeric alcohol contains repeat units derived from an alkylene oxide having from 2 to 6 carbon atoms wherein the number of repeat groups is from about 3 to about 30, and wherein said tetrafluoroethylene based telomer fluoroalcohol is $CF_3CF_2(CF_2CF_2)_x\ CH_2CH_2OH$ where x is from about 1 to about 19.

34. A monohydric polyfluorooxetane copolymer composition according to claim 33, wherein said unit is said



wherein n is 1 to about 3, wherein R is methyl or ethyl, wherein said Dp is from about 2 to about 20, wherein OR^1 is derived from benzyl alcohol, trifluoroethanol, allylic alcohol, heptafluorobutanol, pentafluoropropanol, pentafluorobutanol, nonafluorohexanol, various perfluoroalkylethanols, or combinations thereof, and wherein Rf contains from 1 to 8 carbon atoms and has at least 85% of the non-carbon atoms being fluorine atoms.

35. A copolymer composition according to claim 31, wherein said composition contains an amount of cyclic oligomer which is less than about 10% by weight based upon the total weight of said mono-

hydric polyfluorooxetane copolymer, and any oligomer or polymer produced.

36. A copolymer composition according to claim 33, wherein said composition contains an amount of cyclic oligomer, which is less than about 5% by weight based upon the total weight of said monohydric polyfluorooxetane copolymer, and any oligomer or polymer produced.

37. A copolymer composition according to claim 34, wherein said composition contains an amount of cyclic oligomer which is less than about 2% or less by weight based upon the total weight of said monohydric polyfluorooxetane copolymer, and any oligomer or polymer produced.

38. A copolymer composition according to claim 31, wherein said at least one co-unit is derived from a monomer containing an epoxy (oxirane) functionality, a monomer having a 4-membered cyclic ether group (oxetane); a monomer having a 5-membered cyclic ether group, 1,4-dioxane, 1,3-dioxane, 1,3-dioxalane, trioxane, or caprolactone; or combinations thereof.

39. A copolymer composition according to claim 33, wherein said at least one co-unit is derived from a monomer containing an epoxy (oxirane) functionality, a monomer having a 4-membered cyclic ether group (oxetane); a monomer having a 5-membered cyclic ether group, 1,4-dioxane, 1,3-dioxane, 1,3-dioxalane, trioxane, or caprolactone; or combinations thereof.

40. A copolymer composition according to claim 34, wherein said at least one co-unit is derived from monomers of epichlorohydrin,

propylene oxide, ethylene oxide, butyl glycidylether, perfluorooctyl propylene oxide, trimethylene oxide, 3,3-bis(chloromethyl) oxetane, 3,3-bis(bromomethyl) oxetane, 3,3-bromomethyl(methyl)oxetane, tetrahydrofuran, tetrahydropyran, 2-methyltetrahydrofuran, 1,4-dioxane, 1,3-dioxane, or 1,3-dioxalane, or combinations thereof.

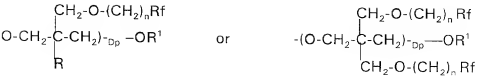
41. A copolymer composition according to claim 38, wherein said composition contains an amount of cyclic oligomer which is less than about 10% by weight based upon the total weight of said monohydric polyfluorooxetane copolymer, and any oligomer or copolymer produced.

42. A copolymer composition according to claim 39, wherein said composition contains an amount of cyclic oligomer which is less than about 5% by weight based upon the total weight of said monohydric polyfluorooxetane copolymer, and any oligomer or copolymer produced.

43. A copolymer composition according to claim 40, wherein said composition contains an amount of cyclic oligomer which is less than about 2% or less by weight based upon the total weight of said monohydric polyfluorooxetane copolymer, and any oligomer or copolymer produced.

44. A functionalized oligomer, polymer, or copolymer composition comprising:

a monohydric polyfluorooxetane oligomer, polymer, or copolymer having a functional end group thereon, and said oligomer, or polymer, or copolymer comprising a unit of the formula



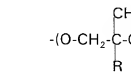
or combinations thereof, where OR^1 is derived from a monoalcohol, where Dp is from 2 to about 150, where n is the same or different and independently is an integer from 1 to about 6, R is hydrogen or an alkyl of 1 to 6 carbon atoms, and each Rf is the same or different and independently on each repeat unit is a linear or branched fluorinated alkyl of 1 to 20 carbon atoms, a minimum of 75 percent of the non-carbon atoms of the alkyl being fluorine atoms and optionally the remaining non-carbon atoms being H, I, Cl, or Br; or each Rf is the same or different and independently is a perfluorinated polyether having from 4 to 60 carbon atoms.

45. A functionalized oligomer, polymer, or copolymer composition according to claim 44, wherein said functional group is a melamine, an amine, an acetylacetate, an epoxide, a silyl, an isocyanate, an acrylate, a methacrylate, or an allylic, or a derivative thereof.

46. A functionalized oligomer, polymer, or copolymer composition according to claim 45, wherein said terminated functional group is an acrylate, a methacrylate, or an allylic, or a derivative thereof.

47. A functionalized oligomer, polymer, or copolymer composition according to claim 45, wherein said Dp is from 2 to about 50, and wherein Rf is a perfluoronated alkyl group having from 1 to about 8 carbon atoms, and wherein R^1 is derived from a monoalcohol comprising an organic alcohol, a polymeric alcohol, a tetrafluoroethylene based telomer fluoroalcohol, or combinations thereof.

48. A functionalized oligomer, polymer, or copolymer composition, according to claim 47, wherein said unit is said



wherein n is 1 to about 3, wherein R is methyl or ethyl, and wherein OR^1 is derived from benzyl alcohol, trifluoroethanol, allylic alcohol, heptafluorobutanol, pentafluoropropanol, pentafluorobutanol, nonafluorohexanol, various perfluoroalkylethanols or combinations thereof, and wherein Rf has at least 85% of said non-carbon atoms being fluorine atoms.

49. A functionalized copolymer composition according to claim 44, including at least one co-unit which is derived from a monomer containing an epoxy (oxirane) functionality, a monomer having a 4-membered cyclic ether group (oxetane); a monomer having a 5-membered cyclic ether group, 1,4-dioxane, 1,3-dioxane, 1,3-dioxalane, trioxane, or caprolactone; or combinations thereof.

50. A functionalized copolymer composition according to claim 45, including at least one co-unit which is derived from a monomer containing an epoxy (oxirane) functionality, a monomer having a 4-membered cyclic ether group (oxetane); a monomer having a 5-membered cyclic ether group, 1,4-dioxane, 1,3-dioxane, 1,3-dioxalane, trioxane, or caprolactone; or combinations thereof.

51. A functionalized copolymer composition according to claim 47, including at least one co-unit which is derived from monomers of epichlorohydrin, propylene oxide, ethylene oxide, butyl glycidylether, perfluorooctyl propylene oxide, trimethylene oxide, 3,3-bis(chloromethyl) oxetane, 3,3-bis(bromomethyl) oxetane, 3,3-

bromomethyl(methyl)oxetane, tetrahydrofuran, tetrahydropyran, 2-methyltetrahydrofuran, 1,4-dioxane, 1,3-dioxane, 1,3-dioxalane, or combinations thereof.

52. A functionalized oligomer, polymer, or copolymer composition according to claim 44, wherein said composition contains a cyclic oligomer which is less than about 10% by weight based upon the total weight of said monohydric polyfluorooxetane oligomer, polymer, or copolymer.

53. A functionalized oligomer, polymer, or copolymer composition according to claim 47, wherein said composition contains a cyclic oligomer which is less than about 5% by weight based upon the total weight of said monohydric polyfluorooxetane oligomer, polymer, or copolymer.

54. A functionalized oligomer, polymer, or copolymer composition according to claim 50, wherein said composition contains a cyclic oligomer which is less than about 2% or less by weight based upon the total weight of said monohydric polyfluorooxetane oligomer, polymer, or copolymer.

55. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 1 and optionally a polymer or copolymer, or monomers forming said polymer or copolymer.

56. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 5 and a polymer or copolymer, or monomers forming said polymer or copolymer.

57. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 6 and optionally a polymer or copolymer, or monomers forming said polymer or copolymer.

58. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 8 and a polymer or copolymer, or monomers forming said polymer or copolymer.

59. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 9 and optionally a polymer or copolymer, or monomers forming said polymer or copolymer.

60. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 14 and a polymer or copolymer, or monomers forming said polymer or copolymer.

61. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 15 and optionally a polymer or copolymer, or monomers forming said polymer or copolymer.

62. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 19 and a polymer or copolymer, or monomers forming said polymer or copolymer.

63. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 22 and a polymer or copolymer, or monomers forming said polymer or copolymer.

64. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 31, and optionally a polymer or copolymer, or monomers forming said polymer or copolymer.

65. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 34, and a polymer or copolymer, or monomers forming said polymer or copolymer.

66. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 37, and a polymer or copolymer, or monomers forming said polymer or copolymer.

67. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 38, and a polymer or copolymer, or monomers forming said polymer or copolymer.

68. A laminate comprising:

a composition on a substrate, said composition derived from a monohydric polyfluorooxetane of claim 43, and optionally a polymer or copolymer, or monomers forming said polymer or copolymer.

69. A laminate comprising:

a composition on a substrate, said composition derived from the functionalized oligomer, polymer, or copolymer of claim 44, and optionally a polymer or copolymer or monomers forming said polymer or copolymer.

70. A laminate comprising:

a composition on a substrate, said composition derived from the functionalized oligomer, polymer, or copolymer of claim 45, and a polymer or copolymer or monomers forming said polymer or copolymer.

71. A laminate comprising:

a composition on a substrate, said composition derived from the functionalized oligomer, polymer, or copolymer of claim 48, and a polymer or copolymer or monomers forming said polymer or copolymer.

72. A laminate comprising:

a composition on a substrate, said composition derived from the functionalized oligomer, polymer, or copolymer of claim 49, and a polymer or copolymer or monomers forming said polymer or copolymer.

73. A laminate comprising:

a composition on a substrate, said composition derived from the functionalized oligomer, polymer, or copolymer of claim 52, and a polymer or copolymer or monomers forming said polymer or copolymer.

74. A laminate comprising:

a composition on a substrate, said composition derived from the functionalized oligomer, polymer, or copolymer of claim 54, and a polymer or copolymer or monomers forming said polymer or copolymer.